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Date: September 21, 1961

Originating Dept.

Answering letter date

Subject: Sediment Removal, K-1407-B Holding Pond

KR-167

Copy To:

Mr. J. P. Murray
ORGDP (Mr. R. J. Clouse - Mr. G. M. DelCour - Mr. W. D. McCluen - Mr. E. O. Sternberg)
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Plant Records ✓

Nuclear safety considerations have been given to the removal from the K-1407-B holding pond, of approximately 4000 tons of waste sediment containing very low concentrations of slightly enriched uranium.[1] The sediment, which has accumulated since early plant operations, will be trucked to an on-plant, 6 ft. deep retention basin just west of the holding pond area.

Nuclear Safety

Although the holding pond wastes have originated from various plant locations in the past, they now originate principally from the K-1420 uranium recovery facility, via a safe drain system,[2] and from a K-1401 maintenance operation involving nonenriched uranium. In order to assure compliance with plant discard specifications,[3] a routine waste control analysis program has been in effect, with results indicating an average uranium concentration of 75 ppm U in the waste sediment; the maximum concentration noted was only 500 ppm U, and the maximum U-235 enrichment was less than 3.0%.

Hank Culb.

1 Letter from G. M. DelCour to A. J. Mallett, Request for Nuclear Safety Consideration, Removal of K-1407-B Holding Pond Sediment, September 19, 1961.

2 Henry, H. F., K-1420 Uranium Recovery Facility - Nuclear Safety Summary, December 10, 1959 (KSA-217).

3 Parsons, J. A., Process Engineering Quarterly Progress Report, June 8, 1961 (KP-1755, Part 8).

Since the uranium accountability analyses indicate such low concentrations of slightly enriched uranium, these covering 100 different sampling locations throughout the holding pond, there does not appear to be a significant nuclear safety problem in this case. The concentration of the U-235 isotope in the sediment wastes, based on the maximum uranium concentration, U-235 enrichment, and sediment volume noted, is only about 0.02 grams U-235 per liter. This value, which is greater by a factor of 10 than that indicated by actual uranium accountability results, is considered to be sufficiently conservative to allow for possible sampling and analytical errors, and is well below a safe value of 5 grams per liter in aqueous homogeneous solution.[4] The holding pond waste sediment is, therefore, considered to be nuclearly nonreactive and may be handled without mass or geometry limitations. However, the sediment retention basin will be back filled with dirt, the area will be plainly and permanently identified as such, and a record of this transfer will be maintained.

Conclusion

The removal and storage of the K-1407-B holding pond sediment appears safe as outlined herein.

A. J. Mallett
Nuclear Safety Department

C. E. Newlon:AJM:mh

4 Henry, H. F., Mallett, A. J., Newlon, C. E., and Pryor, W. A., Criticality Data and Nuclear Safety Guide Applicable to the Oak Ridge Gaseous Diffusion Plant, May 22, 1959 (K-1019, 5th Revision).